GOAL 1:

Clean Air *and* Global Climate Change

Protect and improve the air so it is healthy to breathe and risks to human health and the environment are reduced. Reduce greenhouse gas intensity by enhancing partnerships with businesses and other sectors.

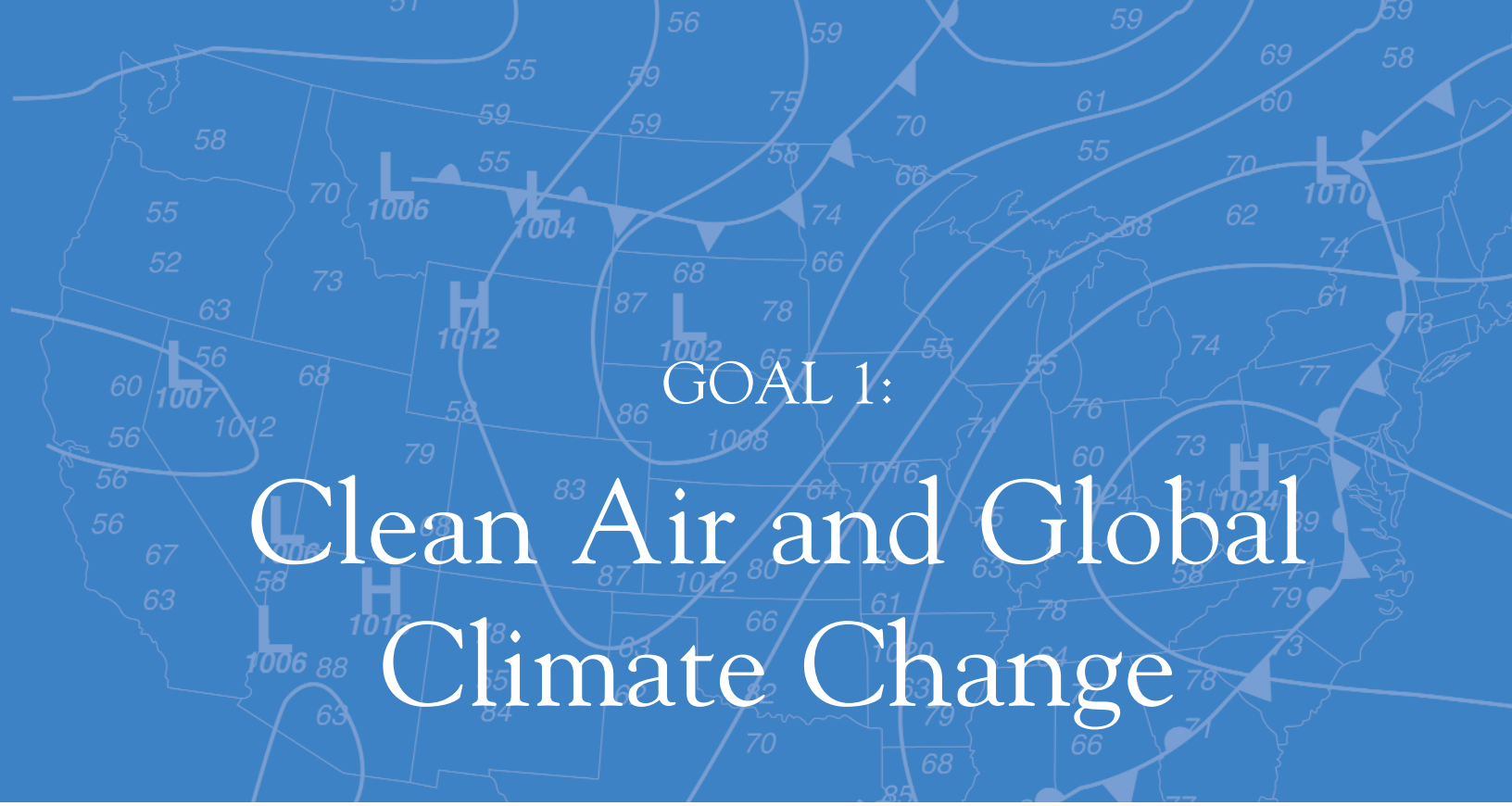
EPA, together with state, tribal and local partners, is addressing a broad range of national air quality problems cost-effectively with a variety of regulatory and non-regulatory approaches, including innovative, market-based techniques such as emissions trading, banking, and averaging. EPA also works closely with public- and private-sector partners and stakeholders to develop tools, such as monitoring, modeling, and emission inventories, that allow states, tribes, and localities to address more localized problems. Many of these tools employ innovative techniques, such as partnership programs for retrofitting diesel engines or community-based approaches to toxics, which are well-suited to the local nature of these challenges.

EPA's programs will allow us, together with our partners, to make substantial progress in protecting human health and ecosystems from air pollution. By 2011, virtually all of the country will have put in place controls to meet current air quality standards. New motor vehicles, including trucks and buses, will be 75 to 95 percent cleaner than they were in 2003. Power plant emissions will be reduced by approximately 40 percent from 2003 levels. Taken together, these programs, when fully implemented, will prevent tens of thousands of premature deaths and hospitalizations, and prevent millions of lost work and school days each year. These national programs will be supplemented by local control strategies designed to ensure that the air quality standards are achieved and maintained.

Reductions in emissions of air toxics will substantially reduce risks to human health. Toxic emissions from cars, trucks, and buses will be cut in half, and all major industrial sources of air toxics will meet technology-based standards. Additional risk reductions will be achieved by voluntary programs aimed at indoor hazards such as radon, tobacco smoke, and asthma triggers, and outdoor hazards such as overexposure to the sun. Radiation releases will be minimized, and our ability to monitor such releases will be enhanced. Should a radiation release occur, EPA personnel and assets will be in place and prepared to support federal emergency response and to minimize impacts to human health and the environment.

Significant achievements will also be realized in EPA's domestic and international efforts to protect and restore the world's atmosphere. By 2011, worldwide efforts to protect the earth's ozone layer will reach a watershed, as total effective equivalent stratospheric chlorine reaches its peak and begins to decline. And EPA's voluntary climate protection programs will put us on track to exceed the President's greenhouse gas intensity goal.

William L. Wehrum
Acting Assistant Administrator
Office of Air and Radiation



GOAL 1:

Clean Air and Global Climate Change

Air pollution comes from many sources: factories and power plants; drycleaners; cars, buses, and trucks; even windblown dust and wildfires. It can threaten human health, causing breathing difficulties, long-term damage to respiratory and reproductive systems, cancer, and premature death. Certain chemicals emitted into the air diminish the protective ozone layer in the upper atmosphere, resulting in overexposure to ultraviolet radiation and increased rates of skin cancer, cataracts, and other health and ecological effects. Air pollution can also affect the environment by reducing visibility; damaging crops, forests, and buildings; acidifying lakes and streams; and stimulating the growth of algae in estuaries and the build-up of toxins in fish. These effects pose a particular risk to Native Americans and others who subsist on plants, fish, and game. Rapid development and urbanization in other countries are creating air pollution that threatens not only those countries but also the United States, since air pollution can travel great distances and across national boundaries.

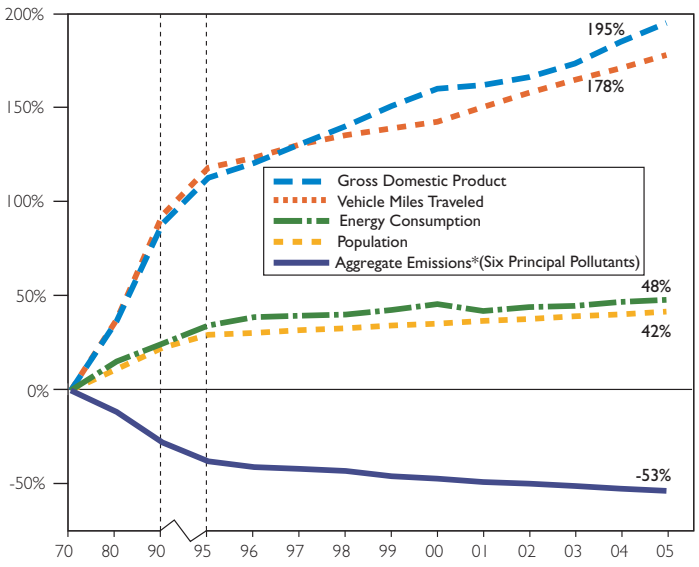
OBJECTIVES

EPA works to protect human health and the environment by developing regulations and establishing partnerships with other federal agencies, states, tribes, local governments, business and industry, environmental groups, and other stakeholders in programs to reduce air pollution. And according to our annual summary of air quality trends since the 1970s,[1] air quality in the United States has steadily improved. Even as our economy has grown, miles traveled by cars and trucks increased, and energy consumption risen, the trend toward cleaner air has continued.

EPA is dedicated to improving the quality of the air Americans breathe, and we will continue to look for innovative, effective solutions to the nation's remaining air pollution problems. We use a variety of approaches and tools to accomplish this. For example, we are addressing problems with broad national or global impact—emissions from power plants and other large sources, pollution from motor vehicles and fuels, and stratospheric ozone depletion—at the federal level, using our traditional regulatory tools as well as innovative, market-based techniques such as

emissions trading, banking, and averaging. We are working with states, tribes, and local agencies to address regional and local ambient air problems. Collaborating with public- and private-sector partners, we are developing tools and innovative strategies, such as partnership programs for retrofitting diesel engines or community-based approaches to toxics, to help solve local problems and promote a community ethic of environmental stewardship. We work with developing countries to reduce transboundary air pollution, improve the health of our citizens and theirs, and reduce greenhouse gas emissions.

Comparison of Growth Areas and Emissions



***Pollutants:** Ozone, Particulate Matter, Carbon Monoxide, Nitrogen Dioxide, Sulfer Dioxide, Lead

Many reports have highlighted the importance of the indoor environment to human health, including the 1997 report of the Presidential/Congressional Commission on Risk Assessment and Risk Management. To improve the quality of the air in homes, schools, and commercial buildings, EPA relies on partnership-based information and outreach programs, which encourage and promote voluntary action. Our radon and other indoor air programs have helped to reduce asthma triggers, respiratory ailments, ear infections, exposure to secondhand tobacco smoke, and hospitalizations.

EPA research continues to identify new air pollution issues, in areas from indoor air to radiation. We will work with our federal, state, tribal, local, and international partners and stakeholders to address these issues using approaches and programs that encourage cost-effective technologies and practices.

OBJECTIVE 1.1: HEALTHIER OUTDOOR AIR

THROUGH 2011, WORKING WITH PARTNERS, PROTECT HUMAN HEALTH AND THE ENVIRONMENT BY ATTAINING AND MAINTAINING HEALTH-BASED AIR-QUALITY STANDARDS AND REDUCING THE RISK FROM TOXIC AIR POLLUTANTS.

Sub-objective 1.1.1: Ozone and $PM_{2.5}$. By 2015, working with partners, improve air quality for ozone and $PM_{2.5}$ as follows:

Strategic Targets

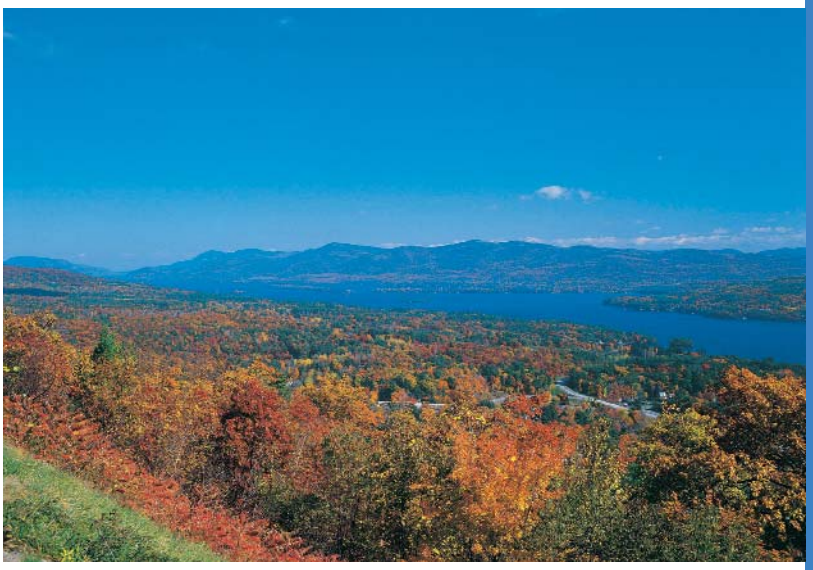
- By 2015, reduce the population-weighted ambient concentration of ozone in all monitored counties by 14 percent from the 2003 baseline.
- By 2015, reduce the population-weighted ambient concentration of $PM_{2.5}$ in all monitored counties by 6 percent from the 2003 baseline.
- By 2011, reduce emissions of fine particles from mobile sources by 134,700 tons from the 2000 level of 510,550 tons.

- By 2011, reduce emissions of nitrogen oxides (NO_X) from mobile sources by 3.7 million tons from the 2000 level of 11.8 million tons.
- By 2011, reduce emissions of volatile organic compounds from mobile sources by 1.9 million tons from the 2000 level of 7.7 million tons.
- By 2018, visibility in eastern Class I areas will improve by 15 percent on the 20 percent worst visibility days, as compared to visibility on the 20 percent worst days during the 2000–2004 baseline period.
- By 2018, visibility in western Class I areas will improve by 5 percent on the 20 percent worst visibility days, as compared to visibility on the 20 percent worst days during the 2000–2004 baseline period.
- By 2011, with EPA support, 30 additional tribes (6 per year) will have completed air quality emission inventories. (FY 2005 baseline: 28 tribal emission inventories.)
- By 2011, 18 additional tribes will possess the expertise and capability to implement the Clean Air Act in Indian country[2] (as demonstrated by successful completion of an eligibility determination under the Tribal Authority Rule). (FY 2005 baseline: 24 tribes.)

Sub-objective 1.1.2: Air Toxics. By 2011, reduce the risk to public health and the environment from toxic air pollutants by working with partners to reduce air toxics emissions and implement area-specific approaches as follows:

Strategic Targets

- By 2010, reduce toxicity-weighted (for cancer risk) emissions of air toxics to a cumulative reduction of 19 percent from the 1993 non-weighted baseline of 7.24 million tons.
- By 2010, reduce toxicity-weighted (for non-cancer risk) emissions of air toxics to a cumulative reduction of 55 percent from the 1993 non-weighted baseline of 7.24 million tons.



Sub-objective 1.1.3: Chronically Acidic Water Bodies. By 2011, due to progress in reducing acid deposition, the number of chronically-acidic water bodies in acid-sensitive regions of the northern and eastern United States should be maintained at or below the 2001 baseline of approximately 500 lakes and 5,000 kilometers of stream-length in the population covered by the Temporally Integrated Monitoring of Ecosystems/Long-Term Monitoring Survey. The long-term target is a 30 percent reduction in the number of chronically-acidic water bodies in acid-sensitive regions by 2030.

Strategic Targets

- By 2011, reduce national annual emissions of sulfur dioxide (SO_2) from utility electrical power generation sources by approximately 8.45 million tons from the 1980 level of 17.4 million tons, achieving and maintaining the acid rain statutory SO_2 emissions cap of 8.95 million tons.

- By 2011, reduce total annual average sulfur deposition and mean ambient sulfate concentration by 30 percent from 1990 monitored levels of up to 25 kilograms per hectare for total sulfur deposition and 6.4 micrograms per cubic meter for mean ambient sulfate concentration.
- By 2011, reduce total annual average nitrogen deposition and mean total ambient nitrate concentration by 15 percent from 1990 monitored levels of up to 11 kilograms per hectare for total nitrogen deposition and 4.0 micrograms per cubic meter for mean total ambient nitrate concentration.

Means and Strategies for Achieving Healthier Outdoor Air

Our strategy for reducing outdoor air pollution is based on collaboration at the federal, state, and local levels. States are primarily responsible for maintaining and improving air quality and meeting national ambient air quality standards (NAAQS) established by EPA. State programs develop emission inventories, operate and maintain air monitoring networks, perform air quality modeling, and develop State Implementation Plans (SIPs) that lay out control strategies for improving air quality and meeting NAAQS.

Multi-jurisdictional organizations (MJOs) are vital in addressing regional issues, collaborating with states on control strategies, and providing technical assistance in data analyses and air quality modeling.

EPA assists states, tribes, local agencies, and MJOs by providing technical guidance and financial assistance to support their efforts. We also develop regulations and implement programs to reduce pollution from the most widespread and significant sources of air pollution: mobile sources, such as cars, trucks, buses, and construction equipment, and stationary sources, such as power plants, oil refineries, chemical plants, and dry cleaning operations. In addition, we address at a national level air quality issues that exceed the reach of state and tribal authorities—such as interstate transport of pollutants.

EPA is authorized to implement air quality programs in Indian country; however, eligible tribes may be authorized to develop and implement their own Clean Air Act programs. We are working with tribes to acquire more and better data on the quality of air on tribal lands,[3] build tribal capacity to administer air programs in Indian country, and establish mechanisms that will enable EPA and states to work effectively with tribal governments on regional and national policy issues. We will assist any tribe interested in making a determination on its air quality by providing data, data analysis, and technical support.

We will continue to involve communities, civic organizations, and other stakeholders in designing programs to achieve healthier outdoor air. We will work closely with the National Environmental Justice Advisory Council, community-based organizations, and other stakeholders (including schools and universities, environmental organizations, and business and industry groups) to ensure that environmental justice is an integral part our programs, policies, and activities. To support this commitment, we will develop baseline data that will enable us to track our progress in addressing environmental justice concerns.

EPA will continue to apply sound science to help us better understand and characterize the results of our efforts to achieve clean air. EPA scientists will determine the relative risks that air pollution poses to human health and the environment; identify the best means to detect, abate, and avoid environmental problems associated with air pollutants; and evaluate the effectiveness of control programs in reducing exposure to harmful levels of air pollution. We are committed to common-sense, cost-effective solutions that result in cleaner air, and we will continue to integrate critical scientific assessment with policy, regulatory, and non-regulatory activities. Using mathematical models, data from ambient monitoring and deposition monitoring, and other information, we will work with states and tribes to evaluate control options, control plans, the impacts of alternative emission scenarios, and the effect of federal rules and other control strategies. We will continue to conduct exposure and risk assessments on criteria and hazardous air pollutants, integrating monitoring and modeling information to characterize the impacts of sources of air pollution within and outside of the United States.

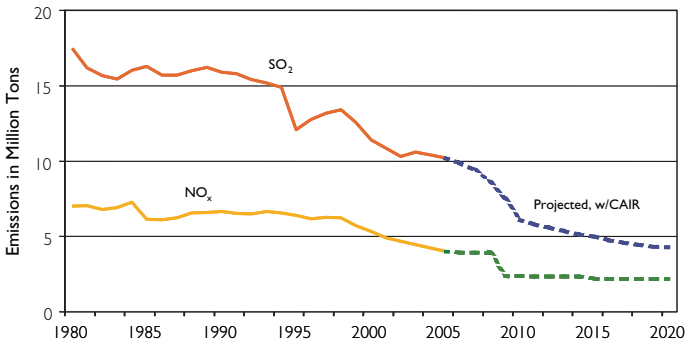
Ozone and Particulate Matter

To improve air quality, EPA will continue to focus on implementing the fine particulate matter ($PM_{2.5}$) standards and 8-hour ozone standards. In support of state efforts, we will develop federal programs for mobile and stationary sources that achieve large, nationwide, cost-effective reductions in emissions of PM and its contributors (SO_2, NO_X, and elemental and organic carbon), ozone-forming NO_X, and volatile organic compounds. We will work with states to reduce emissions of PM and ozone precursors and mercury from electric-generating units and to better integrate ozone and PM efforts, for example, by improving emission inventories, developing comprehensive air quality modeling approaches, controlling sources of precursors common to both, and coordinating control strategy planning cycles. Working with MJOs, we will develop strategies for reducing regional haze.

Key to our efforts is implementing the Clean Air Interstate Rule (CAIR), promulgated in May 2005, to address pollution from power plants that drifts across state borders. Like the cap-and-trade approach of our Acid Rain Program, CAIR provides incentives for power plant operators to find the best, fastest, and most efficient ways to make the required emission reductions. We expect CAIR to reduce SO_2 emissions by 4.3 million tons (more than 70 percent) and NO_X emissions by 1.7 million tons (more than 60 percent) from 2003 levels. As we implement CAIR, we will also continue to support passage of the President's Clear Skies legislation, which would achieve broader reductions of SO_2 and NO_X and provide more certainty for industry and state and local air quality planners.

CAIR is an important component of EPA's plan to help states in the eastern United States meet EPA's health-based air quality standards. Through CAIR and other Clean Air Act programs, 92 of the 108 areas that had not met the standards for 8-hour ozone and 17 of the 36 areas that had not met the standards for $PM_{2.5}$ as of April 2005 will achieve these health-based national standards by 2011. We estimate that by 2015 air quality improvements from CAIR and other Clean Air Act programs could generate more than $100 billion in health and visibility

Significant Cuts in NO_X and SO_2 Power Plant Emissions Projected with CAIR



Source: EPA

Environmental Justice: Reducing Diesel Exhaust in High Impact Areas

EPA's National Clean Diesel Campaign (NCDC) supports diesel retrofit projects to reduce PM, NO_X, and other emissions. As one important criterion for distributing grant funds, we consider how well a project serves areas that are experiencing disproportionate impacts from diesel exhaust. To reduce children's exposure to particulate matter and other pollutants, the campaign also targets diesel emissions from school buses. By regulating new engines more stringently and building partnerships to address the existing diesel fleet, the NCDC furthers EPA's efforts to encourage environmental stewardship.

benefits per year. We expect that by reducing sulfur and nitrogen deposition, these programs will also reduce the incidence of chronically acidic lakes and streams.

Working with our partners, EPA will implement a series of national programs to dramatically reduce emissions from a wide range of mobile sources:

- The Tier 2 Vehicle and Gasoline Sulfur Program, to be fully implemented by 2009, will make new cars, sport utility vehicles, pickup trucks, and vans 77 to 95 percent cleaner than 2003 models, while reducing sulfur levels in gasoline by 90 percent.
- Our Clean Diesel Truck and Bus Program will require that, beginning in 2007, all new highway diesel engines be as much as 95 percent cleaner than current models, while reducing sulfur levels in highway diesel fuel by more than 97 percent.
- The Clean Air Nonroad Diesel Rule will cut emission levels from construction, agricultural, and industrial diesel-powered equipment by more than 90 percent, while removing 99 percent of the sulfur in nonroad diesel fuel by 2010. As part of this effort, we are also developing more stringent standards for locomotives, large marine diesel engines, and small gasoline engines (such as those used in lawn and garden equipment).

To address diesel emissions, EPA's National Clean Diesel program will continue to develop new engine and fuel standards and conduct activities to reduce emissions from the 11 million diesel engines already in use. For example, we will create cost-effective diesel-retrofit partnerships to reduce NO_X and PM emissions from older, high-polluting trucks, buses, and nonroad equipment, concentrating on nonattainment areas and areas with sensitive populations and raising public awareness of the risks diesel emissions pose to health. We will provide grants for retrofitting, replacing, and reducing idling from vehicles and equipment in the trucking, railroad, construction, school bus, and port sectors and encourage states and industry to support local diesel retrofit projects. These innovative initiatives will support states' efforts to meet national air quality standards.

Implementing provisions of the Energy Policy Act of 2005 will be a major undertaking for EPA. Central to this effort is the Renewable Fuel Standard (RFS) program, which requires that the U.S. gasoline supply contain specific volumes of renewable fuel each calendar year, starting with 4 billion gallons in 2006 and increasing to 7.5 billion in

2012. Developing and implementing the RFS program will require a substantial investment of resources: expertise in renewable fuels (production, distribution, and blending); vehicle testing to assess the impacts of renewable fuels on emissions; refinery modeling; transportation modeling and life-cycleanalysis; consideration of energy security impacts; and economic analyses (including farm/agricultural impacts).

Air Toxics

EPA regulates emissions of 186 toxic air pollutants, including dioxin, asbestos, toluene, and such metals as cadmium, mercury, chromium, and lead compounds.[4] To complement the national standards that address major stationary sources of air toxics, we are conducting national, regional, and community-based efforts to reduce multimedia and cumulative risks. Characterizing emissions and the risks they pose nationally and locally, such as in Indian country, will require significant effort. We will need to update the science and keep the public informed about these issues. Toxic pollutants are of particular interest to the environmental justice community because of the proximity of many low-income and minority communities to sources of toxic emissions, such as industrial facilities, waste transfer stations, roadways, and bus terminals. To better address areas that may suffer disproportionately, EPA will use tools and indicators to identify locations with potential environmental justice concerns.

EPA will continue implementing the Clean Air Mercury Rule (CAMR), promulgated in May 2005, to permanently cap and reduce mercury emissions from coal-fired power plants. CAMR establishes standards of performance that limit mercury emissions from new and existing coal-fired power plants and creates a market-based cap-and-trade program that will reduce utility emissions of mercury nationwide in two phases. The cap for the first phase is 38 tons, and utilities can take advantage of "co-benefit" reductions, such as mercury reductions achieved by reducing SO_2 and NO_X emissions under CAIR. In the second phase, which begins in 2018, coal-fired power plants will be subject to a second cap, which will ultimately reduce emissions to 15 tons. Like CAIR, the CAMR program has stringent emissions monitoring and reporting requirements modeled after those of the Acid Rain Program. The flexibility of allowance trading creates financial incentives to look for new and low-cost ways to reduce emissions and improve the effectiveness of pollution control equipment.

The Clean Air Act also requires EPA to establish standards to reduce emissions of air toxics from motor vehicles and their fuels. In March 2006, EPA proposed standards to limit the benzene content of gasoline and to reduce emissions from passenger vehicles and portable gasoline containers. EPA will finalize this rule in 2007 and implement it in subsequent years.

EPA continues to develop and refine tools, training, handbooks, and information to assist our partners in characterizing risks from air toxics, and we will work with them on strategies for making local decisions to reduce those risks. As EPA implements its community-based air toxics programs, including Community Action for a Renewed Environment (CARE), we will evaluate how program activities affect areas with potential environmental justice issues. We will work with affected communities to address risks and track progress. We will use data from our national toxics monitoring network and from local assessments to better characterize risk and assess priorities.

Working with Tribes and Other Partners

To reduce risks and protect the health of all people living in Indian country, EPA is committed to working with tribes on a government-to-government basis to develop the infrastructure and skills they need to assess, understand, and control air quality on their lands. In consultation with tribes, we will establish needed federal regulatory authorities consistent with EPA's Indian Policy, and we will support tribal traditions and culture. We will help tribes develop and manage their own air programs, providing technical support, assistance in developing and analyzing data, and opportunities to participate in planning and policy-setting at the regional and national level. When tribes choose not to develop their own programs, EPA will implement air quality programs directly. We will continue to support air monitoring in Indian country, and we are exploring opportunities for mercury and other deposition monitoring. EPA has developed new rules for new or modified major and minor sources of air pollution in Indian country, and we will work with tribes to delegate or implement these rules directly in all of Indian country.

As we develop and implement clean air strategies, we will involve the public in meaningful ways and work with other federal agencies to ensure a coordinated approach. Our federal partners include the U.S. Department of Agriculture (in the areas of animal feeding operations, agricultural burning, and controlled burning), the U.S. Department of Transportation (for transportation-related air quality issues), the U.S. Department of Energy (for electric utilities, electricity generation, and energy efficiency issues), and the U.S. Department of the Interior (concerning visibility in national parks and wilderness areas).

Effective partnerships are also key to our sound science efforts. For example, we will continue to collaborate with the U.S. Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) to develop a consistent, national numerical air quality model for short-term air quality forecasts for ozone and PM. EPA will also work with the international science community to better understand the movement of pollutants in and out of the United States and to assess potential mitigation strategies.

Criteria air pollutants, such as ozone and fine particles, as well as persistent bioaccumulative toxins (PBTs), such as mercury, dioxins, and polychlorinated biphenyls (PCBs), can be transported across national borders. EPA is also working with other agencies and other governments to address this transboundary pollution. We will work with NOAA, the National Aeronautics and Space Administration, and other agencies to detect, track, and forecast the effects of these air pollutants from international sources. By engaging with the international scientific community, we hope to improve our understanding of international flows and our tools for analyzing and evaluating response policies. Working through bilateral agreements, international partners, and multilateral international organizations (such as the United Nations Environment Program and the Organization for Economic Cooperation and Development), we will promote capacity building, technology transfer, and other strategies to reduce foreign sources of pollution.

EPA will continue to lead the United States in a variety of international partnerships and agreements:

- The Partnership for Clean Fuels and Vehicles (www.unep.org/pcfv) is working to phase out leaded gasoline worldwide, to reduce sulfur in fuels, and to adopt clean vehicle technologies.
- The Partnership for Clean Indoor Air (www.pciaonline.org) is reducing the health risks faced by the more than 2 billion people who burn biomass fuels indoors for cooking and heating.
- The Convention on Long-Range Transboundary Air Pollution (www.unece.org/env/lrtap) and the Stockholm Convention on Persistent Organic Pollutants (www.pops.int) are controlling sources of internationally transported pollutants to protect U.S. interests.

We will continue to work with Canada, Mexico, and key stakeholders to manage air quality along our common borders. Among our existing agreements are the U.S.-Mexico La Paz Agreement (http://air.utep.edu/bca/jac/agreement.html), the U.S.-Canada Air Quality Agreement (www.epa.gov/airmarkt/usca/agreement.html), and the North American Agreement on Environmental Cooperation (www.naaec.gc.ca/eng/agreement/agreement_e.htm).

OBJECTIVE 1.2: HEALTHIER INDOOR AIR

Through 2012, working with partners, reduce human health risks by reducing exposure to indoor air contaminants through the promotion of voluntary actions by the public.

Sub-objective 1.2.1: Radon. By 2012, the number of future premature lung cancer deaths prevented annually through lowered radon exposure will increase to 1,250 from the 1997 baseline of 285 future premature lung cancer deaths prevented.

Sub-objective 1.2.2: Asthma. By 2012, the number of people taking all essential actions to reduce exposure to indoor environmental asthma triggers will increase to 6.5 million from the 2003 baseline of 3 million. EPA will place special emphasis on children and other disproportionately impacted populations.

Sub-objective 1.2.3: Schools. By 2012, the number of schools implementing an effective indoor air quality management plan will increase to 40,000 from the 2002 baseline of 25,000.

Means and Strategies for Achieving Healthier Indoor Air

Air inside homes, schools, and workplaces can be more polluted than outdoor air in the largest and most industrialized cities.[5] Given that people typically spend close to 90 percent of their time indoors,[6] many of us may be more at risk from indoor than from outdoor air pollution. Moreover, people who are apt to spend the most time indoors—children, the elderly, and the chronically ill, especially those suffering from respiratory or cardiovascular disease—may be those most susceptible to indoor air pollutants. EPA is also concerned about minority, low-income, or other populations that may be facing disproportionate risks from indoor air pollution, such as secondhand tobacco smoke and other asthma triggers.

To improve indoor air quality, EPA relies on innovative, non-regulatory outreach and partnership programs that inform and educate the public about indoor air quality concerns, such as radon, and actions they can take to reduce potential risks in homes, schools, and workplaces. We collaborate with groups such as health care providers in urban areas, who treat children prone to or suffering disproportionately from asthma attacks; school personnel, who manage school environments; county and local environmental health officials; and housing and building organizations. To support these partnerships, we provide policy and technical recommendations based on the most current science available.

EPA will provide tools and technical assistance as requested to assist tribes in collecting data on indoor pollutants, such as radon and mold, as well as environmental triggers of asthma. This data will help tribal communities assess the pervasiveness of indoor air quality problems and develop a baseline from which to measure success in improving indoor air, including the accomplishments and benefits provided by such programs as Tribal Effective Asthma Management (www.epa.gov/region08/air/iaq/asthma/asthma.html#2) and Tools for Schools (www.epa.gov/iaq/schools/index.html). We will work with other federal agencies to provide guidance and assistance on reducing these contaminants in all Indian communities. Through the State Indoor Radon Grant Program, we will continue to help states and tribes develop and implement effective radon assessment and mitigation programs.

OBJECTIVE 1.3: PROTECT THE OZONE LAYER

By 2011, total effective equivalent stratospheric chlorine will have reached its peak and begun its gradual decline to a value less than 3.4 parts per billion of air by volume.

Strategic Targets

- By 2015, reduce U.S. consumption of Class II ozone-depleting substances to less than 1,520 tons per year of ozone depleting potential from the 2003 baseline of 9,900 tons per year.
- By 2165, reduce the incidence of melanoma skin cancer to 14 new skin cancer cases avoided per 100,000 people from the 1990 baseline of 13.8 cases avoided per 100,000 people.

Means and Strategies for Protecting the Ozone Layer

Scientific evidence amassed over the past 3 decades has shown that chlorofluorocarbons and hydrochlorofluorocarbons (used as refrigerants, solvents, and for other purposes), halons, (fire-extinguishing agents), methyl bromide (a pesticide), and other halogenated chemicals used around the world are depleting the stratospheric ozone layer. As a result, more harmful ultraviolet (UV) radiation is reaching

the earth,[7] increasing the risk of overexposure and consequent health effects, including skin cancer, cataracts, and other illnesses. More than a million new cases of skin cancer are diagnosed each year;[8] 1 in 5 Americans is expected to experience skin cancer; and more than half of all Americans develop cataracts by the time they are 80 years old.[9]

As a signatory to the *Montreal Protocol on Substances that Deplete the Ozone Layer*,[10] the United States regulates and enforces Montreal Protocol provisions domestically. In accordance with this international treaty and related Clean Air Act requirements,[11] EPA will continue implementing domestic programs to reduce and control ozone-depleting substances (ODS) and enforcing rules on their production, import, and emission. Our approach combines market-based efforts with sector-specific technology guidelines to facilitate alternatives to hydrochlorofluorocarbons. We will work in partnership with stakeholders to smooth the transition to ODS substitutes that reduce greenhouse gas emissions and save energy and act on 100 percent of the petitions for substitutes within 90 days of receipt. To help reduce emissions internationally, we will assist in transferring technology to developing countries and work with them to accelerate the phase-out of ODS. We estimate that from 1990 to 2165, worldwide phase-out of ODS will save 6.3 million lives from fatal skin cancer, avoid 299 million cases of nonfatal skin cancers, and avoid 27.5 million cases of cataracts in the United States alone.[12]

Because the ozone layer is not expected to recover until the middle of this century at the earliest,[13] the public will continue to be exposed to high levels of UV radiation.[14] To address this concern, we will continue education and outreach efforts to encourage school children and their caregivers to change their behavior to reduce UV-related health risks. The SunWise program (www.epa.gov/sunwise/), which we expect to grow from 200 participating kindergarten–grade 8 schools in 2000 to 20,000 by 2011, will teach thousands of school children and adults how to protect themselves from overexposure to the sun.

OBJECTIVE 1.4: RADIATION

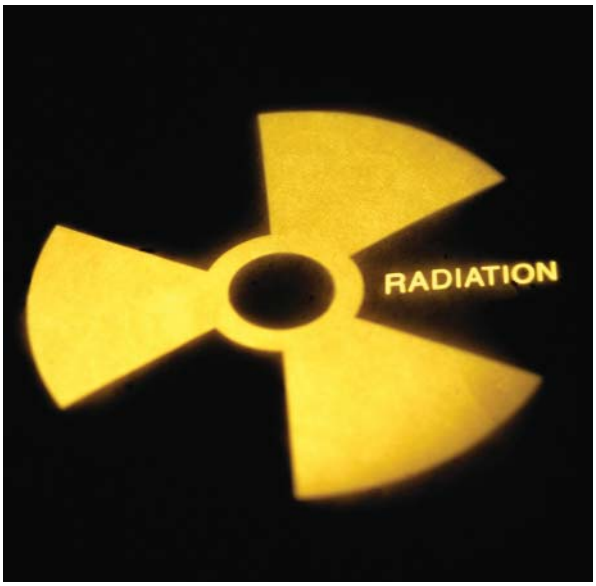
Through 2011, working with partners, minimize unnecessary releases of radiation and be prepared to minimize impacts to human health and the environment should unwanted releases occur.

Strategic Targets

- By 2011, 77 percent of the U.S. land area will be covered by the RadNet ambient radiation air monitoring system. (2001 baseline is 35 percent of the U.S. land area.)
- By 2011, the radiation program will maintain a 90 percent level of readiness of radiation program personnel and assets to support federal radiological emergency response and recovery operations. (2005 baseline is a 50 percent level of readiness.)

Means and Strategies for Minimizing Releases of Radiation and Related Impacts

EPA continues to meet statutory mandates for managing radiation waste and controlling radioactive emissions and to fulfill its responsibilities under presidential decision directives for radiological emergency preparedness and response. These responsibilities form the core of our strategy to protect the public and the environment from unnecessary exposure to radiation. We will work with states, tribes, and industry to develop innovative training, public information, and partnership programs to minimize these exposures. We will also conduct radiation-risk assessments to evaluate health risks from radiation exposure; determine appropriate levels for cleaning up contaminated sites; and develop radiation protection and risk management policy, guidance, and rules.



Mining and processing naturally radioactive materials for use in medicine, power generation, consumer products, and industry inevitably generate emissions and waste. EPA will provide guidance and training to help federal and state agencies prepare for emergencies at U.S. nuclear plants, transportation accidents involving shipments of radioactive materials, and acts of nuclear terrorism. EPA will also develop guidance for cleaning up radioactively–contaminated Superfund sites. To manage radioactive releases and exposures, we will conduct health-risk site assessments; risk modeling, cleanup, and waste management activities; voluntary programs to minimize exposure to radiation in commercial products and industrial applications; national radiation monitoring; and radiological emergency response.

In response to state and local organizations, EPA will continue to provide advice and guidance to help locate, identify, and dispose of radioactive sources that find their way into non-nuclear facilities, particularly scrap yards, steel mills, and municipal waste disposal facilities. We will work with the International Atomic Energy Agency and other federal agencies to prevent metals and finished products suspected of having radioactive contamination from entering the country. Through partnerships with states, local agencies, and tribes we will locate and secure lost, stolen, or abandoned radioactive sources within the United States and investigate and promote practices to reduce industrial radioactive releases. We will expand our ongoing efforts to ensure that tribes receive assistance in dealing with radon exposures in their homes and schools.

One of EPA's major responsibilities related to radiation is certifying that all radioactive waste shipped by the U.S. Department of Energy (DOE) to the Waste Isolation Pilot Plant is disposed of safely and according to EPA's standards. We inspect waste generator facilities and biennially evaluate DOE's compliance with applicable environmental laws and regulations.

OBJECTIVE 1.5: REDUCE GREENHOUSE GAS EMISSIONS

By 2012, 160 million metric tons of carbon equivalent (MMTCE) of emissions will be reduced through EPA's voluntary climate protection programs.[15]

Sub-objective 1.5.1: Buildings Sector. By 2012, 46 MMTCE will be reduced in the buildings sector (compared to the 2002 level).

Sub-objective 1.5.2: Industry Sector. By 2012, 99 MMTCE will be reduced in the industry sector (compared to the 2002 level).

Sub-objective 1.5.3: Transportation Sector. By 2012, 15 MMTCE will be reduced in the transportation sector (compared to the 2002 level).

Means and Strategies for Reducing Greenhouse Gas Emissions

In 2002, the President announced a U.S. climate policy to reduce greenhouse gas (GHG) intensity by 18 percent over the next decade. EPA's strategy for helping to achieve this goal is to collaborate with private and public organizations to reduce GHG intensity while providing additional benefits, from cleaner air to lower energy bills. At the core of these efforts are government-industry partnership programs designed to encourage consumers, businesses, and organizations to make sound investments in energy efficient equipment, policies and practices, and transportation choices.

EPA is collaborating with other federal agencies to maximize results under our climate protection programs. In addition to reducing greenhouse gas emissions and supporting such EPA goals as clean air, these programs can help other agencies achieve their strategic goals. For example, EPA and the Department of Energy (DOE) jointly implement the ENERGY STAR Program to promote energy-efficient products and practices (www.energystar.gov). Not only does ENERGY STAR support EPA's objective to reduce GHG emissions from homes, businesses, and industry, it also supports DOE's goal to cost-effectively improve energy efficiency (DOE Strategic Theme 1: Energy Security). ENERGY STAR can also help make housing more affordable by delivering energy savings to low-income and subsidized areas. We are coordinating our ENERGY STAR marketplace activities with DOE's research and development, regulatory activities, and technology demonstrations, and we are using complementary measures of our progress in the buildings sector.

We will also continue collaborating with DOE through EPA's SmartWay Transport Partnership, which works with fleets and the trucking and railroad industries to promote energy-efficient strategies, such as reducing idling, using low-carbon fuels like E85 and biodiesel, and reducing PM and NO_X emissions (www.epa.gov/smartway). SmartWay also supports DOE's goals for increasing energy diversity and cost-effectively improving energy efficiency (DOE Strategic Theme 1: Energy Security). To promote efficient, energy-saving technologies that reduce GHG, NO_X, and PM, we are working together to:

- Increase the number of filling stations that offer E85 ethanol by leveraging market forces, tax incentives, regulations, and state and local efforts.

- Promote idling control technologies, such as plug-in electric power at truck stops and auxiliary power units, which can save fuel and eliminate associated emissions.
- Develop protocols for measuring heavy duty truck fuel efficiency, allowing transporters to choose fuel-efficient trucks and increase fuel savings.

To assess progress under these joint efforts, EPA is working with other federal agencies to adopt complementary measures of performance. In one pilot effort, for example, EPA and DOE will be working jointly to promote idling technologies that will save fuel and to add new fueling stations offering E85 ethanol.

EPA will be managing a number of other partnership efforts to inform the marketplace and more quickly deploy technology in the residential, commercial, and transportation sectors:

- Partnerships with the energy, industrial, and agricultural sectors to promote technologies and practices for reducing methane and other potent GHGs (www.epa.gov/nonco2/voluntaryprograms.html).
- The Green Power, Combined Heat and Power, and other partnerships to encourage developing and purchasing clean and renewable energy (http://epa.gov/cleanenergy).
- The Best Workplaces for Commuters Program to benefit commuters and reduce vehicle trips and miles traveled (www.commuterchoice.gov).
- Climate Leaders, an EPA-industry-government partnership to develop long-term comprehensive climate change strategies and set corporate-wide goals for reducing GHGs (www.epa.gov/climateleaders).
- The Clean Energy-Environment State Partnership to support states in increasing the use of clean energy (www.epa.gov/cleanenergy/stateandlocal/partnership.htm).

EPA also promotes international partnerships to reduce GHGs and deploy clean technologies. Through the Methane to Markets Partnership, we will work with other countries and the U.S. private sector to reduce global methane emissions, enhance economic growth, promote energy security, and improve the environment by using cost-effective methane recovery technologies (www.methanetomarkets.org). In addition, the United States has joined Australia, China, India, Japan, and South Korea in the Asia-Pacific Partnership on Clean Development and Climate (www.asiapacificpartnership.org), which will advance the President's goal for cleaner and more efficient technologies and practices.

We will also continue to develop and assess innovative technologies for achieving clean air. We will continue to develop advanced clean and fuel-efficient automotive technology. We will collaborate with our private-sector partners to promote the transfer of technologies to help meet the more demanding size, performance, durability, and towing requirements of sport utility and urban delivery vehicles without compromising performance, safety, or reductions in emissions. We will also promote renewable fuel blends with the greatest environmental benefits to maximize their potential for reducing GHG intensity and improving air quality.

OBJECTIVE 1.6: ENHANCE SCIENCE AND RESEARCH

Through 2012, provide sound science to support EPA's goal of clean air by conducting leading-edge research and developing a better understanding and characterization of human health and environmental outcomes.

Means and Strategies for Enhancing Science and Research

EPA's Air Research Program provides information we need to set and implement NAAQS and to ensure that residual risks associated with exposure to hazardous air pollutants (air toxics) are being reduced. We conduct research at EPA laboratories, through extramural grants (including five Particulate Matter Research Centers), and by co-funded partnerships (for instance, with the National Institute of Environmental Health Sciences and the Health Effects Institute [HEI]).

We are targeting our air research to achieve measurable improvements in two areas: reducing uncertainty in the science that supports us in setting air standards and reducing uncertainty about the effects of air pollutants on human health. To achieve these goals, our air research program will focus on:

Developing data and tools to support NAAQS. EPA research will provide new and updated data and new methods and models to characterize and estimate source emissions. Enhanced air quality models that more accurately reflect meteorological effects and improve our ability to forecast air quality changes will enable EPA, states, and tribes to alert the public to air quality concerns. Advances in receptor-based models will more accurately identify which source categories contribute to ambient concentrations, enabling us to target control strategies. Research will also investigate technologies for addressing multiple pollutants from key sources contributing to non-attainment or air toxics problems. We will also be developing a framework for assessing the impact of regulatory measures in improving air quality and environmental and human health.

Understanding the effects of air pollution on health. With HEI and other research partners, we are undertaking a systematic evaluation of PM attributes that will help us understand how exposure to PM and related air toxics can affect various aspects of health, including pulmonary, cardiovascular, immunological, neurological, reproductive, and developmental health, and we will focus particularly on susceptible populations.

Linking sources and effects. Research will enable us to link health effects more closely to specific sources and PM attributes, advancing the state of air pollution science and allowing us to better target sources of greatest impact and improve control measures and strategies to minimize the impact of particle and air toxics emissions. This will be the major theme of the Particulate Matter Centers' 5-year program.

HUMAN CAPITAL

EPA has been successful in recruiting and retaining talented staff with the scientific and technical backgrounds we need in several areas. For example, the EPA National Vehicle and Fuel Emissions Laboratory and the Clean Air Technology program have attracted high quality engineers and scientists.

However, EPA faces a shortage of staff skills to implement new air program requirements, such as CAIR and the Energy Policy Act of 2005. For example, to implement CAIR we will need to develop the workforce skills to support emissions measurement, engineering technology, environmental assessment, and computer database development and administration. Similarly, to develop a national renewable fuel standard and promulgate regulations to implement it, EPA will need staff with expertise in renewable fuels, vehicle testing, refinery modeling, transportation modeling and life-cycle analysis, energy security impacts, and economic analysis. The recruiting strategy we will use to address these gaps includes cooperative agreements with several top engineering colleges.

PERFORMANCE MEASUREMENT

EPA has made great strides in developing measures that focus on the environmental results of our clean air and global climate change work. Our strategic targets directly track and measure our annual performance goals (APGs), established in EPA's Annual Plan and Budget and reported on in our annual *Performance and Accountability Report*. For instance, the APGs for reductions in the population-weighted ambient concentration of ozone and $PM_{2.5}$ programs set annual targets based on our strategic targets. We have also developed annual measures that directly track strategic targets for the number of people taking all essential actions to reduce exposure to indoor environmental asthma and the number of schools implementing effective indoor air quality management plans.

To track our annual progress toward our research objectives, we will use a number of objective measures of customer satisfaction, product impact and quality, and efficiency. For example, we rely on independent expert review panel ratings, client surveys on the usefulness of our products, and analyses demonstrating the actual use of EPA research products.

We have aligned our strategic and annual measures with environmental indicators to be included in EPA's forthcoming 2007 *Report on the Environment*. Environmental indicators reflected in this *2006–2011 Strategic Plan* include trends of national ambient concentrations and emissions of criteria air pollutants (and their precursors, such as ozone and fine particulate matter), mercury point-source emissions,

ambient levels of stratospheric chlorine (which can deplete the ozone layer), and greenhouse gas emissions.

We have also included as strategic targets all of the clean air and global climate change long-term, outcome-oriented measures developed through Office of Management and Budget (OMB) Program Assessment Rating Tool (PART) assessments. These targets include the population-weighted ambient concentration targets for ozone and $PM_{2.5}$, and the toxicity-weighted risk reduction goals for air toxics.

Improving Performance Measurement

As we developed this *2006–2011 Strategic Plan*, we examined some of the longer-term opportunities to improve our measures of environmental outcomes for the future. We are continuing our work to develop long-term measures that capture the environmental benefits of the air and climate change programs, for example, by measuring the benefits of reduced ultraviolet exposure on human health directly.

USING FEEDBACK FROM PERFORMANCE ASSESSMENTS AND PROGRAM EVALUATIONS

Ambient Air Quality Program

In the PART evaluation of the Acid Rain Program, OMB recommended that EPA work to: (1) overcome statutory limitations that set maximum emission reduction targets and limit the scope of emissions trading and program benefits; and (2) develop efficiency measures based on the full cost of the program. We have addressed the first recommendation by promulgating CAIR, which is projected to reduce SO_2 and NO_X emissions beyond Title IV and uses a cap-and-trade approach modeled after the Acid Rain Program. We are addressing the second recommendation by developing data and methods to support efficiency measures that reflect industry and EPA costs.

The National Academy of Sciences evaluated the nation's air quality management system[16] and concluded that while emitted pollutants have been substantially reduced over the past 30 years, further progress is hindered by scientific and technical limitations in the current system. To address some of these issues, EPA is: (1) developing air quality-ecosystem indicators for the future tracking of trends in human exposure and ecological condition; (2) exploring opportunities to co-locate ambient air monitoring and atmospheric deposition monitoring with long-term ecological research study sites; and (3) improving methods for monitoring atmospheric inputs to ecosystems, such as ambient mercury concentrations and mercury deposition. We are also developing and expanding the use of high-order health and ecological indicators and characterizing the movement of air pollutants through ecosystems over time.

Indoor Air

OMB's PART assessment has led our Indoor Air Program to better quantify the relationship between funding levels and results, improve transparency by making state radon grantee performance data more accessible to the public, and improve the program's efficiency measures to more clearly demonstrate cost effectiveness.

Mobile Source–Clean Air Technology Program

As a result of a 2005 PART evaluation, the Clean Air Technology (CAT) program is developing better performance measures that more clearly link program efforts to greenhouse gas reduction potential.

Research

In 2005, the Board of Scientific Counselors (BOSC) evaluated the Particulate Matter and Ozone Research Program and recommended developing long-term measures as well as periodic assessment of customer satisfaction. Recommendations were incorporated into the 2005 PART evaluation of the NAAQS Research Program.

A committee of air pollution experts formed under the National Research Council completed a series of reports in 2004 and made three specific recommendations concerning the management of scientific research:

- EPA should work toward a higher level of sustained integration and interaction among the scientific disciplines and among the full range of public and private research funding organizations.
- Research is needed to develop stronger tools to compile and synthesize the large amounts of new information being developed in this research program.
- Sustained and substantially enhanced management of this program by EPA, accompanied by a continuing mechanism for independent review and oversight of the program, will be the only way to ensure that this investment is being soundly made.

EPA will include actions and milestones to address these recommendations, as well as recommendations on air research that we received from BOSC and PART assessments, in our revised multiyear plan for air research.

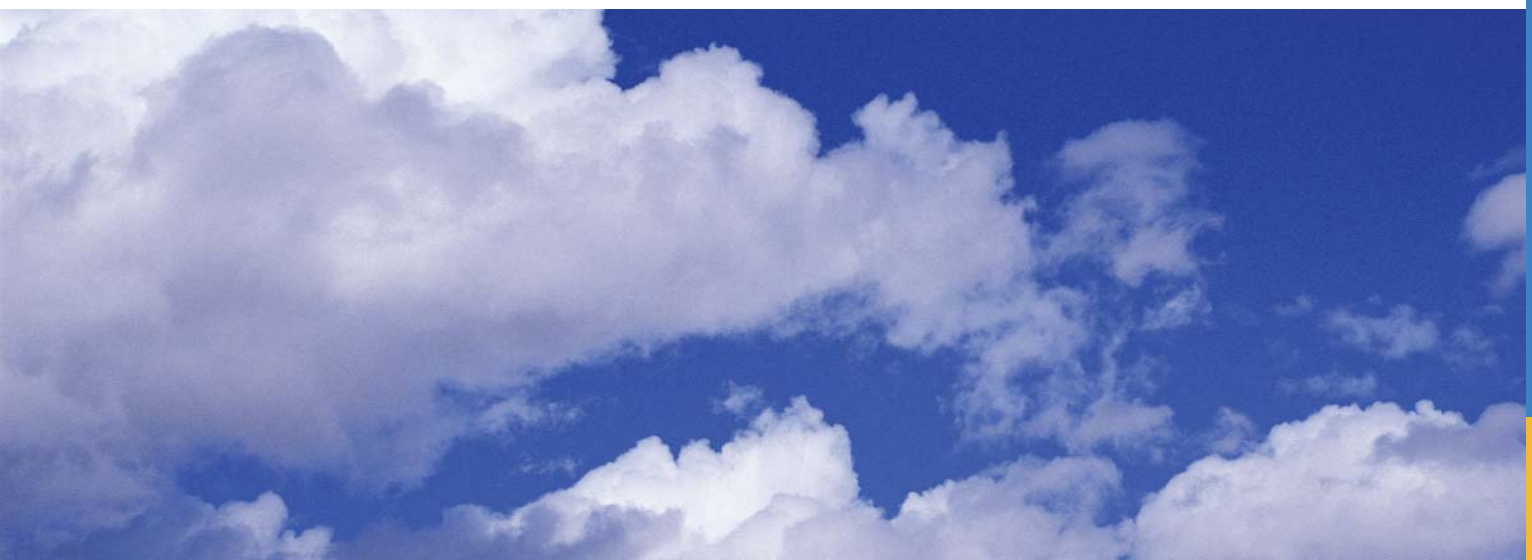
EMERGING ISSUES AND EXTERNAL FACTORS

The current, fundamental imbalance between energy supply and energy demand, and the effect of that imbalance on the economy, is debatably the most significant environmental issue that has emerged since EPA developed our *2003–2008 Strategic Plan*. Concerns around energy supply, economic prosperity, national security, and the environment present unprecedented opportunities for technological innovation in the marketplace.

Higher, more volatile energy prices could create pressures affecting air quality programs and goals. EPA will need to ensure that renewable fuels programs, such as those required under the Energy Policy Act of 2005, are implemented smoothly. Increases in energy prices and the turnover of capital stock in the energy sector will provoke interest in new and more efficient technologies—many of which could improve air quality. EPA will need to work with industry to develop and deploy these technologies in all economic sectors, including transportation and electricity production and end-use. For example, as demand for domestic coal resources increases, EPA will work with the U.S. Department of Energy, coal producers, and others to promote development and marketing of new coal technologies that generate extremely low air emissions, such as integrated gasification combined cycle (or, more broadly, coal gasification with carbon capture and sequestration).

We face another challenge in the rising level of emissions that originate in other countries, threatening progress in the United States and affecting our ability to achieve our public health and environmental standards. The effects of international and intercontinental transport are already apparent, and as energy use and development rapidly increase in Asia and other regions, the United States may feel the impact. Decreasing emissions in developing countries will not replace the need for reducing air pollution emissions within the United States. Rather, international efforts will complement our local and regional control efforts to protect public health and our domestic investments. Thus, to achieve our own domestic goals, we will need to better understand sources of pollution in other countries and work cooperatively to decrease these emissions.

Recent scientific studies indicate that the stratospheric ozone layer is likely to take longer to heal than previously anticipated.[17] Therefore, we expect more people to be exposed to excess UV radiation over a longer period. Timely, comprehensive action by all nations, including the United States, will be more important than ever to restore the



ozone layer and protect people from skin cancer, cataracts, and other illnesses.

A number of external factors could affect achievement of our strategic goals. We rely on state, tribal, and local government programs to meet many of our clean air performance targets; however, reduced budgets and resource constraints could impede their progress. Lawsuits and court action may require EPA to adjust schedules and could delay achievement of critical milestones. Economic conditions and development patterns in the United States and the world and evolving energy and transportation policies could also affect our ability to attain our objectives for clean air and climate change.

Finally, weather conditions and meteorological patterns have a very important effect on air quality. For example, high temperatures and bright sunlight can increase the formation of ozone. Wind can carry air pollution from one area to another, while conditions of little or no wind can cause air pollutants to remain in an area and build up to unhealthy levels. We must also consider these factors as we develop and implement plans and strategies for achieving and maintaining clean air.

To learn more go to: www.epa.gov/ocfo/futures/perspectives.htm.

Notes:

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2. Use of the terms "Indian country," "Indian lands," "tribal lands," "tribal waters," and "tribal areas" within this *Strategic Plan* is not intended to provide any legal guidance on the scope of any program being described, nor is their use intended to expand or restrict the scope of any such programs.
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14. UV irradiance has increased since the early 1980s by 6 to 14 percent at more than 10 sites distributed over mid- and high latitudes of both hemispheres. Information from: United Nations Environment Programme. 2002. *Scientific Assessment of Ozone Depletion*. Available online at http://ozone.unep.org/Publications/6v_science%20assess%20panel.asp: UNEP, The Ozone Secretariat Web Site. Access: April 26, 2006.

15. EPA's climate protection programs contribute to the President's 18 percent GHG emissions intensity reduction goal for 2012. The goal requires prevention of more than 100 MMTCE nationwide in 2012 in addition to the business-as-usual savings that are expected to occur. Of the 103 MMTCE that EPA programs achieve, 80 MMTCE, or about 80 percent, count towards that approximate 100 MMTCE increment. The remaining reductions will come from other programs and initiatives. For more information see www.whitehouse.gov/news/releases/2002/02/climatechange.html.

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